AMENDMENTS TO THE SPECIFICATION

Please replace the paragraphs at page 6, line 6 to page 7, line 16, with the following:

~~To achieve the above-described object, a rolling angle control device for an R/C two-wheeled vehicle according to the present invention is characterized in that it is provided with:~~

~~a vehicle main body, a steering shaft supported on the front section of the vehicle main body at a predetermined caster angle, a front fork to support a front wheel and pivotally rotatable around the steering shaft, a rear wheel disposed at the rear section of the vehicle main body and rotationally driven by a prime motor, and a remote control receiver mounted on the vehicle main body;~~

~~wherein the rolling angle control device is further provided with:~~

~~a rolling angle detection means to detect the rolling angle of the vehicle main body;~~

~~a steering actuator being able to apply a rotational torque in either of the left/right direction to the steering shaft or the front fork;~~

~~a control means to output operation amount of the steering actuator based on the detected rolling angle value by the rolling angle detection means and a rolling angle target value from the remote control receiver so as to bring the detected rolling angle value closer to the rolling angle target value; and~~

~~a steering angle detection means to detect to which at least the neutral point as a boundary the steering angle is turned left or right;~~

~~wherein the control means is configured to apply a signal to the operation amount for the steering actuator, the signal is to apply a right-rotational torque to the steering shaft or the front fork via the steering actuator when the steering angle detected by the steering angle detection means is in the right direction, or to apply a left-rotational torque to the steering shaft or the front fork via the steering actuator when the steering angle detected by the steering angle detection means is in the left direction.~~

To achieve the above-described object, a rolling angle control device for an R/C two-wheeled vehicle according to the present invention is characterized in that it is provided with:

a vehicle main body, a steering shaft supported on the front section of the vehicle main body at a predetermined caster angle, a front fork to support a front wheel and pivotally rotatable around the steering shaft, a steering actuator being able to apply a rotational torque in either the

left/right direction to the steering shaft or the front fork, a rear wheel disposed at the rear section of the vehicle main body and rotationally driven by a prime motor, and a remote control receiver mounted on the vehicle main body, comprising:

a rolling angle detection means to detect the rolling angle of the vehicle main body;

a control means to output an operation amount of the steering actuator based on the detected rolling angle value by the rolling angle detection means and a rolling angle target value from the remote control receiver so as to bring the detected rolling angle value closer to the rolling angle target value; and

a steering angle detection means to detect to which at least the neutral point as a boundary the steering angle is turned left or right;

wherein the control means is configured to apply a signal to the operation amount for the steering actuator, the signal is to apply a right-rotational torque to the steering shaft or the front fork via the steering actuator when the steering angle detected by the steering angle detection means is in the right direction, or to apply a left-rotational torque to the steering shaft or the front fork via the steering actuator when the steering angle detected by the steering angle detection means is in the left direction.

Please replace the paragraphs at page 7, line 17 to page 8, line 11, with the following:

~~The present invention is further characterized in that:~~

~~the rolling angle detection means is configured by an angular velocity sensor to detect the angular velocity of rotation of the vehicle main body around the roll axis and an integration means to calculate the rolling angle of the vehicle main body by integrating a detected angular velocity value obtained from the angular velocity sensor;~~

~~wherein the rolling angle control device is further provided with:~~

~~a target value determination means to determine whether the rolling angle target value received by the remote control receiver is 0°;~~

~~an error correction means to perform a 0 point adjustment for decreasing the detected angular velocity value obtained from the angular velocity sensor when the target value~~

~~determination means determines that the rolling angle target value is 0°, while making correction to decrease the integral value of the integration means.~~

The present invention is further characterized in that:

the rolling angle detection means is configured by an angular velocity sensor to detect the angular velocity of rotation of the vehicle main body around the roll axis and an integration means to calculate the rolling angle of the vehicle main body by integrating a detected angular velocity value obtained from the angular velocity sensor, comprising:

a target value determination means to determine whether the rolling angle target value received by the remote control receiver is 0°; and

an error correction means to make correction to decrease absolute value of the integral value of the integration means when the target value determination means determines that the rolling angle target value is 0°.

Please delete the following paragraph at page 10, line 10:

~~FIG. 14 is an illustration of a configuration example to complement a straight traveling property of a vehicle body utilizing a repulsive force of a pair of magnets; and~~

Please delete the following paragraph at page 10, line 13:

~~FIG. 15 is an illustration of a configuration example to complement the straight traveling property of the vehicle body utilizing a biasing force of an elastic body.~~

Please replace the paragraph at page 20, line 8, with the following rewritten paragraph:

This loop is for providing resistivity against the disturbance (1) (which also decreases the influence to autostability), and for initiating the steering section (the actuator to the front wheel) to rotate sooner in response to ~~the operation amount~~ the steering speed target value and controlling the rotation speed to be as proportional as possible to ~~the operation amount~~ the steering speed target value. It also improves the outer control loops (1) and (2), resulting in that the control of the rolling angle is made faster and more accurate to enhance the travel performance.

Please delete the following paragraph at page 20, line 17:

~~The minor loop (the steering angle speed control loop (3)) achieves the advantages of improvement in the reaction of the steering section and decrease in the probability of being tricked such as by pebbles.~~

Please replace the paragraph at page 20, line 21, with the following rewritten paragraph:

Although there may be a case for the steering angle speed control loop (3) to interfere with the free rotation of the front fork, i.e., the static autostability, the interference to some extent in the rotation of the front fork does not cause a problem because the later-described caster effect control means 51 carries out the same function instead. Thus, the above-described indirect advantages can be obtained by enabling to add the steering angle speed control loop (3).

Please replace the paragraph at page 28, line 21, with the following rewritten paragraph:

(3) The mechanism can be added for the steering angle speed to be proportional to ~~the operation amount~~ the steering speed target value at a small expense to static autostability specific to the vehicle body, thereby it can achieve increased resistivity against a disturbance such as pebbles which directly affect the steering section as well as a decreased influence of the varying magnitude of the mechanical caster effect due to the changes in speed and surface resistance.

Please replace the paragraph at page 29, line 6, with the following rewritten paragraph:

Moreover, the maneuverability is increased due to the enhanced reaction to ~~the operation amount~~ the steering speed target value of the steering section.

Please insert the following paragraph at page 39, between lines 5 and 6 as follows:

That is, the rolling angle control device 21 of this embodiment is further provided with the angular velocity control loop (2) as well as the angle control loop (1), wherein the operation

amount is output to the steering motor 13 corresponding to the angular velocity deviation calculated using the angular velocity ω (the detected value) fed back by the angular velocity control loop (2), thereby the dynamic stability can be achieved which increases/decreases the angular velocity ω of rolling of the vehicle body 2 in response to the degree of the angle deviation. Furthermore, this effect along with the gyro effect of the front wheel 6 prevents the oscillation (hunting) of the vehicle body 2 around the rolling shaft.

Please replace the paragraph at page 39, line 6, with the following rewritten paragraph:

~~That is~~On the other hand, in a case that the R/C model two-wheeled vehicle 1 in the straight traveling condition is turned left for example, by the operator operating the operation stick for adjusting the rolling angle of the R/C transmitter to tilt to the left at a desired angle, the torque is applied from the steering motor 13 to the steering shaft 4 for turning the front wheel 6 first to the right and for tilting the vehicle body 2 to the left. If the vehicle body 2 is about to tilt to the left beyond the rolling angle target value, the torque is applied for turning the front wheel 6 to the left to prevent the tilting motion of the vehicle body 2, and the rolling angle θ_i of the vehicle body 2 is controlled to be restored finally to the angle consistent with the rolling angle target value. Thereby, the vehicle body 2 rolls to the left (to the right when viewed from the front side) at the rolling angle θ_r ($\cong \theta_i$) as shown in FIG. 4, resulting in the vehicle body 2 turning to the left at the turning radius automatically determined by the rolling angle θ_r and the speed.

Please replace the paragraph at page 40, line 1, with the following rewritten paragraph:

~~On the other hand~~Moreover, when the operation stick for adjusting the rolling angle of the R/C transmitter is restored to the neutral position from the above-described left-turning condition for example, the rolling angle target value becomes 0° and thus the angle deviation is generated between that and the rolling angle θ_i of the vehicle body 2. Therefore, the torque is applied from the steering motor 13 to the steering shaft 4 for turning the front wheel 6 first to the left and for raising the vehicle body 2, and the torque is applied for turning the front wheel to the right to prevent the tilting motion of the vehicle body 2 if the vehicle body 2 is about to tilt to the

right beyond the upright position and then the rolling angle of the vehicle body 2 is controlled to be restored finally to substantially 0° for the straight traveling condition.

Please delete the following paragraph at page 40, line 15:

~~Moreover, the rolling angle control device 21 of this embodiment is further provided with the angular velocity control loop (2) as well as the angle control loop (1), wherein the operation amount is output to the steering motor 13 corresponding to the angular velocity deviation calculated using the angular velocity ω (the detected value) fed back by the angular velocity control loop (2), thereby the dynamic stability can be achieved which increases/decreases the angular velocity ω of rolling of the vehicle body 2 in response to the degree of the angle deviation. Furthermore, this effect along with the gyro effect of the front wheel 6 prevents the oscillation (hunting) of the vehicle body 2 around the rolling shaft.~~

Please delete the following paragraph at page 46, line 18:

~~Description for Obtaining Angular Velocity by Differentiating Rolling Angle~~

~~Additionally, for example, by providing the differentiation means (not shown) instead of the angular velocity sensor 22 to differentiate the rolling angle θ, detected by the angle sensor 45 and configuring the angular velocity control loop (4) to feed back the angular velocity ω calculated by the differentiation means to the additive summary point, the effect substantially same as that achieved in the case shown in FIG. 8 can be obtained.~~

Please delete the following paragraph at page 48, line 16:

~~Straight Traveling Complementation by Magnet or Elastic Body~~

~~As described above, the examples have been shown which realize the complementary function electrically for straight traveling property using the steering angle sensor, although the straight traveling property of the traveling vehicle body can be complemented to some extent by utilizing a repulsive force of a pair of magnets or a biasing force of an elastic body, as shown in FIG. 14 and FIG. 15.~~

Please delete the following paragraph at page 49, line 1:

~~In FIG. 14, a permanent magnet piece 18b is disposed at the end of an arm 18a orthogonally continuously disposed to the handle arm 18, and a permanent magnet piece 18c is disposed on the vehicle body side. The permanent magnet pieces 18b and 18c are disposed such that the magnetic lines of force thereof are in an opposite face-to-face relation with each other in the neutral condition and that the line connecting the both poles of the permanent magnet pieces 18b and 18c passes through the steering shaft 4.~~

Please delete the following paragraph at page 49, line 10:

~~Due to the position determined and arranged as described above, the direction of the repulsive force of the both permanent magnet pieces is displaced from that facing the steering shaft 4 when they are displaced from the neutral condition even slightly, thereby the rotational torque against the steering shaft 4 is generated and the stable condition gives way. Therefore, when even a slight displacement from the neutral condition is generated, the repulsive force of the magnets multiplies the displacement to obtain a sufficient caster effect, thus the steering shaft 4 is restored to the neutral condition to complement the straight traveling property of the vehicle body.~~

Please delete the following paragraph at page 49, line 22:

~~Next, in FIG. 15, a plan view is shown of a relevant part of an example achieving a complementary function for the straight traveling property of the vehicle body in the neutral condition by utilizing a contractive force of a tensile spring.~~

Please delete the following paragraph at page 50, line 3:

~~In FIG. 15, one end of the tensile spring 18g as the elastic body is connected to an end 18f of an arm 18e orthogonally disposed to the handle arm 18. The other end of the tensile spring 18g is connected to a point 18h on the vehicle body side. They are positioned such that the straight line connecting the end 18f of the arm 18e and the point 18h on the vehicle body side passes through the steering shaft 4 in the neutral condition.~~

Please delete the following paragraph at page 50, line 10:

~~Due to the position determined and arranged as described above, when they are displaced from the neutral condition even slightly, the rotational torque against the steering shaft 4 is generated by the contractive force of the tensile spring 18g and the stable condition gives way. Therefore, the displacement from the neutral condition of the steering shaft 4 is multiplied to obtain a sufficient caster effect, thus the steering shaft 4 is restored to the neutral condition to complement the straight traveling property of the vehicle body.~~

Please replace the paragraph at page 50, line 22, with the following rewritten paragraph:

Primarily, to control the R/C two-wheeled vehicle, the function to recognize the direction of the gravitational acceleration such as a clinometer (a gravity sensor) is required to control the posture of the straight traveling two-wheeled vehicle and to determine the reference of the rolling angle when rolling, although the clinometer utilizing a weight or an accelerometer is not suitable for the dynamic control of such as the traveling two-wheeled vehicle because an error is generated when the horizontal acceleration is applied~~ and the responsiveness (the frequency characteristic) is compromised by various methods being applied to eliminate an error~~. Thus, an inclination recognition means is required which is dynamically usable and has a good frequency characteristic.